

FOOD SAFETY MANAGEMENT SYSTEMS IN INDIAN SEAFOOD EXPORT INDUSTRY- THE CASE OF KERALA

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ABSTRACT

Indian Fishery trade has expanded considerably in recent decades and this has been an important source of foreign exchange for the country with total earnings of US\$ 5.5 billion in 2014-15. In the interests of food safety and consumer protection, increasingly stringent hygiene measures have been adopted at national and international trade levels. Food safety regulations regime has completely restructured the seafood value chain in India. There has been a proliferation of sector oriented standards and Codes of Practices (COPs) incorporating a range of standards relating to all the elements that make up the food management chain. Major constraints faced by the seafood exporters in Kerala to comply with the above standards and code of practices were identified. Addressing food safety concerns and its implementation in India will require the joint efforts by the government and the private sector.

Key word: FSMS, Seafood Trade, Private standards, Certifications, Kerala, Compliance.

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1. INTRODUCTION

Indian Fishery trade has expanded considerably in recent decades and this has been an important source of foreign exchange for the country with total earnings of US\$ 5.5 billion in 2014-15. India's share in the global fish production constituted around 5.4% and it is the second largest fish producing nation in the world. India is second major producer of aquaculture in the world producing 7 per cent of the world output (Ababouch & Karunasagar, 2013). The fishery sector contributes about 0.9% to the National GDP, and approximately, 5.17% of the agricultural GDP (DAHD, 2015). The seafood processing and export industry

contributes significantly to the Indian economy in terms of employment and foreign exchange earnings. Historically, Indian exports of fish and fishery products have been directed at 3 major markets: the European Union (EU), Japan, and the United States. However, the Indian export destinations changed significantly with the emergence of Southeast Asia as the important market that account for over 38.99 percent of Indian exports in 2014-2015. The way fishery products are prepared, marketed and delivered to consumers has changed significantly during recent years. With the current demand pattern of major seafood markets and with modern machinery for freezing and processing, several exporting firms have started development and exports of processed value added products (Salim&Narayanakumar, 2012).

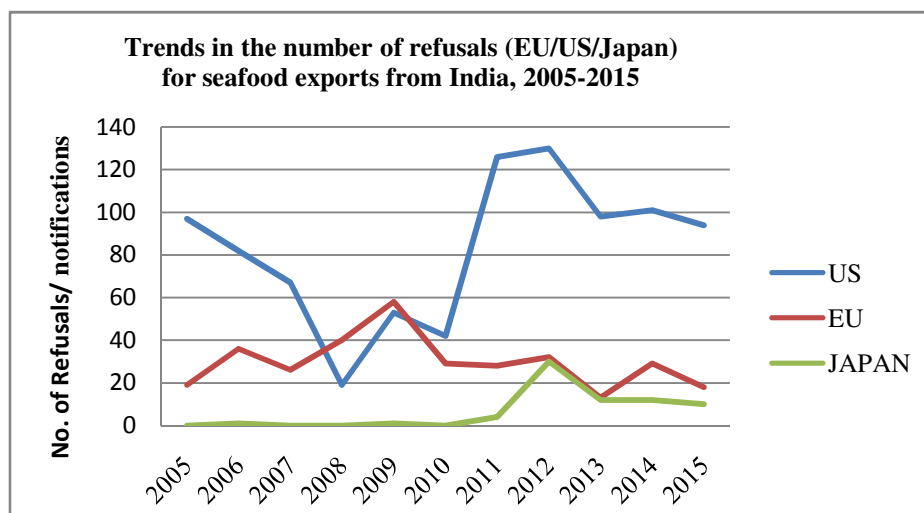
Historically, India has faced a number of challenges meeting hygiene requirements for fish and fishery products in its major export markets, especially the EU and US. Throughout the 1980s and early 1990s, the major source of problems for Indian exporters was the US. While the processing sector expanded rapidly through the 1990s, hygiene controls did not keep pace with emerging requirements in India's major export markets. Since the mid-1990s, the major concern has been compliance with the EU's requirements for hygiene throughout the fish supply chain, alongside the U.S. requirements for HACCP to be implemented in fish processing facilities. Fish and fishery products were subject to compulsory inspection by an Export Inspection Agency until the end of 1991. India's standards for hygiene in fish and fishery products were reformed in 1995. As per the reformation fish and fishery products were again subject to compulsory inspection and certification. The establishment of HACCP cell by the Government of India in 1996 to assist the effective implementation of HACCP in the fishing industry is marked as the first proactive move by the Indian government to enhance food safety controls in the fish and fishery products sector. In 1999, a more comprehensive Food Safety Management Systems-Based certification (FSMSC) was introduced for fish and fishery products along with other commodities. Fish processors wishing to export needed to be certified under this system. The FSMSC system included mandatory integrated pre-processing and ice production facility on processing facility, specific limits on daily outputs and more intensive inspection to EU approved units. (Henson, Saquib&Rajasenan, 2004).The paper discusses the Food Safety Management Systems (FSMS) prevalent in the Indian seafood export industry with special reference to Kerala.

2. DETENTIONS AND REJECTIONS OF INDIAN SEAFOOD IN INTERNATIONAL MARKETS

With the entry of WTO as an international regulatory body on the transnational trade of goods and services, the global trade environment has undergone a drastic change and has impacted India's export of marine products too. Consequently, the agreement on Sanitary and Phytosanitary (SPS) measures has emerged as a major determinant to the flow of agricultural products, particularly marine products to the international market. (Shinoj, Ganesh Kumar, Joshi & Dutta, 2009).

In spite of the comprehensive food safety measures initiated by the Indian government, rates of border rejections have increased over time. Recent rejections, however, are only infrequently related to broader hygiene uses, such as salmonella. Rather, new concerns have arisen related in particular to residues of antibiotics. Antibiotics and bacterial inhibitors became the prominent concerns through 2002 and 2004.

Food safety requirements related to general hygiene and specific microbiological and chemical contaminants in fish and fish products are subject to change over time in response to emerging problems, advances in scientific knowledge, consumer concerns, and political pressures. Recognizing this, various countries have put in place stringent rules and regulations to ensure the quality of imported fish and fishery products.

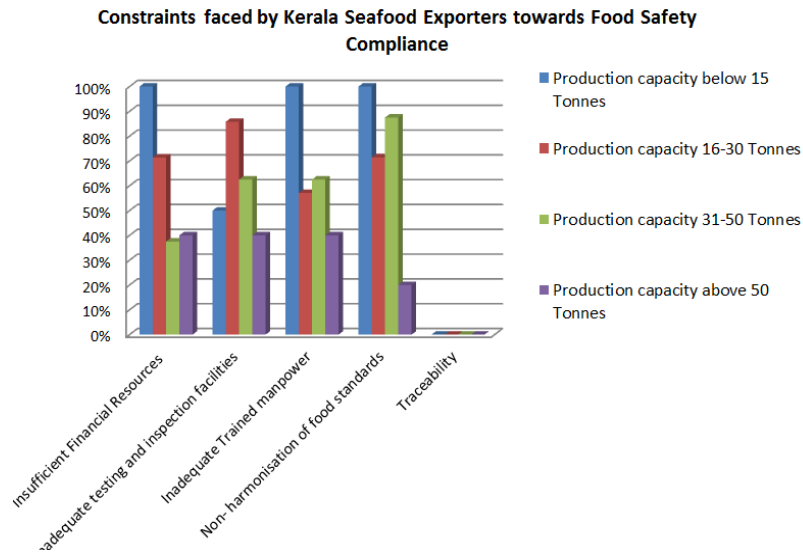


Graph 1 Trends in the import refusals (US) and import notifications (EU/Japan) for the seafood exports from India.

The trend shows that the largest number of refusals from EU in 2008 and 2009 which was contributed by the presence veterinary drug residues and heavy metals in fishery products. Major contribution in this category was due to the presence of nitro furan and its metabolites which constituted about 59% and heavy metals like Mercury and Cadmium (16%). The presence of cadmium was reported in the cephalopods. There has been a comparative decrease in the rejection cases due to veterinary drug residues during the recent year which is constituted by stricter EU regulations. The US trend shows the highest number of refusals during 2011 and 2012 contributed by the presence of microbial pathogens mainly salmonella (48%) which was closely followed by the presence of filth or unsanitary substances (35.2%). The highest number of rejections has been reported in the shrimp and prawn varieties (70.9%) though the quantity of shrimp and prawn exports to US during these years have been less than half of the quantity of fish varieties exported. The trend also shows an increase in the rejection cases due to veterinary drug residues during the recent years constituted by the farm grown shrimp and prawn varieties, a major delicacy in the US. The trend in Japanese import notifications shows a sudden increase in the number of rejections of Indian seafood due to the presence of chemicals, commonly furazolidone and ethoxyquin (94.1%). Frozen Shrimp constituted the highest number of rejections. Rejections due to microbial hazards constituted only a very low percentage.

3. FOOD SAFETY CONCERNS IN KERALA SEAFOOD EXPORT INDUSTRY

Beyond the basic hygiene requirements laid down by India's main markets, namely, EU, Japan, and U.S, exporters face a large number of issues. A survey was conducted at the seafood exporting companies in Kerala to assess the major food safety concerns. Assuming that the economies of scale would work towards reducing the cost of food safety compliance, the respondents were asked to mention their size and production capacity of the firm. The companies were then categorized based on their production capacity (below 15 Tonnes, 16-30 Tonnes, 31-50 Tonnes and above 50 Tonnes) . The constraints faced by the exporters were categorized against four parameters, insufficient financial resources, inadequate testing and inspection facilities, inadequate trained manpower, non-harmonization of food safety standards, and traceability. The Graph (1) shows the response obtained.



Graph 2 Constraints faced by the seafood exporters in Kerala towards food safety compliance

The trend showed significant relation between the food safety concerns and the production capacity of the firms. The larger the firm with more production capacity the lesser were the food safety concerns which was mainly contributed by the financial strength of the firm. Traceability was found to be the least of all the other concerns for almost all the firms under study.

4. THE EVOLUTION OF PRIVATE/VOLUNTARY STANDARDS/CERTIFICATIONS IN KERALA SEAFOOD EXPORT INDUSTRY.

Major share of the Kerala seafood export is contributed by marine capture, with exports dominated by frozen shrimp and cephalopods. With the diversification of Indian marine exports and the increase in the export of processed and value added seafood, the challenges due to food safety are also on rise. Concerns over numerous rejections of Indian seafood exports on food safety grounds have generated greater attention to pervasive food safety problems in the supply chain including high levels of chemical residues, presence of heavy metals, and microbial contamination. The supermarket sector has risen to have an important and often dominant share of food retailing, commonly 70 per cent in developed countries (FAO, 2011a). The present seafood value chain in Kerala is buyer driven or direct network. The exporters has little bargaining power and get subjected to pressure from the importers and chain managers to change the production method, cut labour cost, impose new standards related to safety, quality etc. so that the retailer can maximize the commercial advantage of the relationship. (Somasekharan, Harilal& Thomas, 2015).

The food quality and safety management systems have evolved as the key driver for the organization and management of food production systems in the agribusiness and food industry. Particularly for high value agricultural and food products food safety and quality concerns dominate the competition than the price (Busch & Bain, 2004).The widespread adoption of these FSMS by the food retail and commercial sectors has led to the proliferation of such systems, each with its own standards, accreditation, auditing and certification processes (Albersmeier, Schulze, Jahn& Spiller, 2009). Private food standards are playing an increasingly important role in food safety governance and determining market access in international trade. The adoptions of these standards in agribusiness are so widespread that they have become de facto mandatory as ignoring them is tantamount to losing a significant

share of the market (Bush and Bain, 2004; Henson, 2007; Fuchs & Kalfagianni, 2010). These labelling and certification programmes can be considered as an important strategy for diversifying a product to make it seem different from others. (Anderson & Valderrama, 2009)

Private food safety standards are generally set by private firms and standard setting coalitions and aim to facilitate supply chain management within an increasingly globalised and competitive international food market. The main drivers for the proliferation of these private food safety schemes have been: the clear assignment of legal responsibility to food chain operators for ensuring food safety; increasingly global and complex supply chains; and, increasing consumer awareness of food and food systems and their impact on health and, in particular, on food safety (FAO, 2010).

Private/voluntary food safety certifications in Kerala seafood export sector started from 2001. Every fish processing establishments, that has implemented the mandatory HACCP based quality and safety management programme, get certified by these private certifying bodies too. A survey conducted on the Kerala seafood export sector revealed number of exporting companies opting for the private food safety systems were on rise since 2001. Graph 3 represents the trend in adopting the private/ voluntary food safety systems in the seafood export sector in Kerala. It shows that the certifications went on to a peak in 2009 and 2012. There has been a shift in the preference for the newly certified companies to FSSC 2000 which combined ISO 22000 with PAS 220:2008 and five additional requirements. The number of BAP certifications also shows a recent hike with the increase dependency on aquacultured products to meet the buyer demands. 25% of the total seafood exporting firms in Kerala are certified against any one of the private /voluntary standards and the process is still going on. Companies that choose to become certified have a choice among different private standards, hence a regime of competition exists among standards (Fagoto, 2014). In some cases the firms go for multiple certifications too, 50% of the certified companies in Kerala own multiple certifications.



Graph 3 Trends in the Food Safety Certifications in Kerala Seafood Export Industry from 2001- 2015.

The FSMS certifications most prevalent in Kerala seafood industry are ISO (international Organisation for Standardisation) 22000: 2005, FSSC (Food Safety System Certification) 22000, BRC (British Retail Consortium), IFS (International Food Standard) & GAA-BAP (Global Aquaculture Alliance/Best Aquaculture Practices).

An overview of the food safety management system in the Kerala seafood export sector is represented in the figure 1 which includes the private/ voluntary standards and certifications along with the certifications and registrations mandated by the government authorized agencies. 90% of the certified companies supplied the processed or value added seafood

products to the buyers who supplied to the large supermarkets in the developed countries and the rest of the 10% companies supplied the products directly to the supermarkets with their packaging specifications and logo.

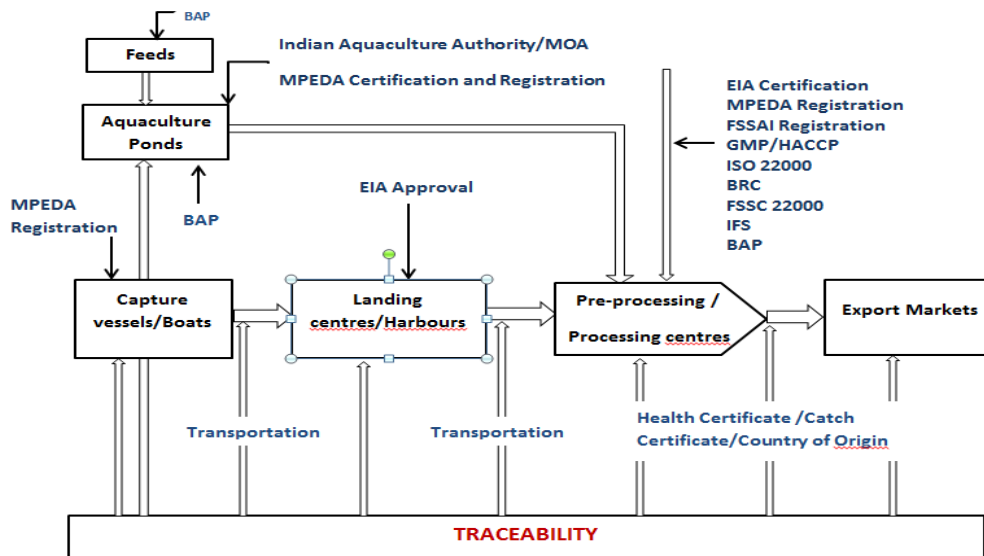


Figure 1 Food Safety Management Systems in the Kerala Seafood Export Industry (MPEDA- Marine Products Export Development Authority, EIA- Export inspection Agency, FSSAI- Food Safety Standard Authority of India)

4.1. International Organisation for Standardisation (ISO 22000: 2005)

ISO, the International Organization for Standardization, is an organization editing several standards regarding processes and systems for many different businesses (ISO Strategic Plan, 2010). ISO 22000:2005 is a quality management system addressing food safety issues in food production and can be applied to all types of organization in the food chain. ISO 22000 integrates the principles of the Hazard Analysis and Critical Control Point (HACCP) system and application steps developed by the Codex Alimentarius Commission. ISO 22000 requires that all hazards that may be reasonably expected to occur in the food chain, including hazards that may be associated with the type of process and facilities used, are identified and assessed. ISO 22000:2005 is not recognized by GFSI due to the lack of technical specification for sector PRPs.

4.2. British Retail Consortium (BRC)

Developed by the British Retail Consortium for companies providing retailer-branded food products in 1996 to use their due diligence defense as per the legal requirements of EU General Product Safety Directive and the United Kingdom Food Safety Act in a food safety failure. It is a global standard that covers manufacturing, storage and distribution, packaging, and consumer products. The key features of BRC are included in the table 1. The BRC standard for food safety is based on systems for quality management, HACCP and GMP and includes requirements for routines regarding quality management (BRC Global Standards, 2011).

4.3. Food Safety System certification 22000 (FSSC 22000)

FSSC 22000 is developed by the Foundation of food safety certification, with the support from Food and drink industries of the European Union (CIAA) (Bureau Veritas, 2007). The FSSC 22000 combines the ISO 22000 FSMS with a set of pre-requisite programme

requirements (ISO/TS 22002:1:2009 (PAS 220/2008)). PAS 220 was developed to specify requirements on prerequisite programs (PRP) to control food safety hazards during the food processing and to support management systems implemented to fulfill the ISO version. FSSC can be applied to a wide range of food manufacturing organisations irrespective of their size or complexity.

4.4. International Features Standard (IFS)

Developed by German retailers group in 2003 to audit food manufacturer's product, food safety and quality of processes. IFS have developed standards not only for food safety but for logistics, household and personal care products, brokers and wholesale business (IFS, 2010).

4.5. Best Aquaculture Practices (BAP)

Table 1 Key Features of Private Food Safety Standards and Related Schemes prevalent in Kerala compared with relevant Codex standards (FAO, 2010)

	GFSI benchmarked Schemes				International Standards	
	BRC	IFS	FSSC 22000	GAA-BAP	ISO 22000	CODEX Hygiene Principles & other relevant codes
Geographic focus	British market	German, French and Italian market	Europe	International	International	International
Owners	British retail members and trade associations	German, French and Italian retail associations	Foundation for Food Safety Certification	Non-Profit Trade Association	International Standards Organization	FAO/WHO
Members include	Tesco, Sainsbury's, Marks and Spencers	Carrefour, Tesco, Ahold, Wal Mart, Metro, Migros and Delhaize	Standard based on ISO 22 000 & BSI PAS 220	Standards based on ISO19011:2002 ISO/IEC Guide 7: 1994 ISO/IEC Guide 65: 1996 ISO/IEC Guide 17065:2012 ISO/IEC Guide 2: 2004 ISO 9000:2005 GFSI Guidance Document- Issue 5 and Issue 6	105 member bodies (one per country) from Public and private sector. Plus corresponding and subscribing members	180 Member states Plus observers
End users (who apply the standard)	Food manufactures	Food manufactures	Food manufactures	Food manufactures	Entire food chain	Entire food chain

The certification scheme developed by the Global Aquaculture Alliance (GAA) is one of the most significant aquaculture schemes in terms of volumes and global coverage. The standards cover requirements for environmental sustainability, community and social welfare, animal welfare, food safety and traceability in a certification programme for aquaculture facilities. Certified producers are entitled to use the "BAP certification mark"; a label attached to products from certified fish farms. Both farms and processing facilities can be certified (FAO, 2011b).

The developing countries including India are mainly concerned about the investment and recurrent cost of compliance involved in establishing these private food safety standards and certifications. The lack of administrative, technical and scientific capacities to comply with emerging requirements also presents potentially barriers (Jaffee and Henson, 2004). Indian seafood export sector however considers these food safety standards as an opportunity, in spite of the arguments that are prevailing in the international markets as to whether these food safety standards facilitate trade or serve as a barrier. Evidence is provided by the survey conducted on the seafood companies in India to get a view of the strength, weakness, opportunities and threats, in which about 64.86% believed that factories certified with ISO/EU/ BAP/BRC is a real opportunity (Sam, Maheswaran & Gunalan, 2015).

Table 2 GFSI requirements covered in the Key Global Food safety standards (www.sgs.com)

GFSI Requirements	FSSC 22000	BRC	IFS	GAA-BAP
Food Safety Management System	FSMS	Food Safety and Quality Management System	Quality Management System	Quality Management System
	Management responsibility	Senior management commitment and continual improvement	Senior management responsibility	Management responsibility and commitment
	Management of resources	Personnel	Resource management	Resource management
	Planning and Realisation of safe products	Food Safety and Quality Management System, Product control	Production process	Purchasing and specification
	Validation verification and improvement of FSMS	Internal audit, corrective and preventive action and calibration	Measurement, analysis and improvement	Corrective and preventive action
Good Manufacturing Practices (GMP), Good Distribution Practices (GDP), Good Agricultural Practices (GAP)	Planning and Realisation of Safe Products PAS 220	Site standard, Product control, Process control, Personnel	Human resources, Food hygiene requirements (Clauses 4.6-4.18)	Food Safety (Clauses 5.5-5.12)
Hazard Analysis Critical Control Point	Planning and Realisation of Safe Products Validation, Verification and Improvement of FSMS	Food safety plan- HACCP	HACCP	Food safety- HACCP compliance, Control of non-conformity

All the private food safety certifications that are followed in the industry are benchmarked against GFSI. The food experts from retailers, manufacturers and food service companies collaborated with the experts from government departments, accreditation body and certification body to form GFSI (Global Food Safety Initiative), a nonprofit foundation to benchmark various schemes against FSMS requirements. The key elements in the requirements against which the standards are benchmarked are food safety management

systems, good practices for agriculture, manufacturing or distribution and the HACCP system (Table 2). All the schemes benchmarked to the GFSI require traceability systems and monitoring as well as auditing in line with Codex and the HACCP system (FAO, 2011).

5. CONCLUSION

Food borne outbreaks and product recalls creates many challenges for the food industry world over. The complexity and diversity of the modern supply chain adds to it. An ethical approach to food supply chain is needed to meet the demands of the 21st century. Many food organizations aim to create higher standards for themselves and their customers by going beyond the requirements set by the regulatory bodies and hence getting certified against the globally recognized food safety management systems (FSMS). They are adopting the GFSI principle of 'Once certified accepted everywhere'. In Kerala, 25% of the total seafood exporting firms are certified against any one of the private /voluntary standards and this stresses the significance of these food safety certifications in the development of Indian seafood exports. The private/voluntary food safety standards are found to pose serious trade impediments to those firms that export low value products. The survey shows the seafood exporters in India who export high value processed seafood are proactively responding to adoption of these standards. Although the cost of compliance is a limiting factor, in the long run they are deriving the competitive advantage and hence they consider these standards and certifications as an opportunity for India in international trade. Considering the fact that India is becoming a major supplier of farmed shrimp in the global markets, the government of India is planning to develop its own aquaculture certification standard, National Good Aquaculture Practice (GAqP), a voluntary standard which will initially cover the fresh water and brackish water aquaculture (NAAS, 2015). With the ever growing importance of aquaculture in international fishery trade this can be considered as a proactive approach from the Indian government towards securing the position of India in export business. Seafood export sector in Kerala is also in par with their counterparts in getting certified by the private/voluntary food safety standards to provide high quality and safety assured seafood to the world.

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